Name: Date:

Polynomial Factoring solution (version 8)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 84}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-48}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{3}\, i}{2}$$

$$x = -3 \pm 2\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 9i$ and $5 - 4i$ in standard form $(a + bi)$.**

Solution

$$(7 + 9i) \cdot (5 - 4i)$$

$$35 - 28i + 45i - 36i^2$$

$$35 - 28i + 45i + 36$$

$$35 + 36 - 28i + 45i$$

$$71 + 17i$$

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3. **Write function $f(x) = x^3 - 6x^2 + 11x - 6$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	-6	11	-6
3		3	-9	6
	1	-3	2	0

$$f(x) = (x-3)(x^2 - 3x + 2)$$

$$f(x) = (x-3)(x-1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+3)^2 \cdot (x-1) \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.